# 1. INTRODUCTION

## 1.1 PURPOSE

The purpose of this document is to provide a top-level description of the Civilian Radioactive Waste Management System (CRWMS) and its concept of operations as currently envisioned. The document is consistent with current disposal container and repository conceptual designs as described in the viability assessment of the Yucca Mountain site (DOE 1998a). It can be used as a reference for facilitating communication to program participants, regulatory and oversight entities, and stakeholders.

This document represents a snapshot in time; it is to be revised, as appropriate, to reflect future program redirection or evolving system concepts and designs.

## 1.2 PROGRAM MISSION

The *Nuclear Waste Policy Act of 1982,* Public Law 97-425 (the Act), established the Department of Energy's (DOE) responsibility to provide for the permanent disposal of the Nation's high-level radioactive waste (HLW) and spent nuclear fuel (SNF), and directed that the owners and generators of these wastes bear the costs of their disposal. The Act also established the Office of Civilian Radioactive Waste Management (OCRWM) to carry out a mission to provide for the disposal of the Nation's nuclear waste in a geologic repository, in a manner that protects the health and safety of the public and workers, and maintains the quality of the environment. The CRWMS is being developed by OCRWM to fulfill that mission.

Since the enactment of the Act, the OCRWM Program has undergone some changes. The *Nuclear Waste Policy Amendments Act of 1987,* Public Law 100-203, designated the Yucca Mountain site in Nevada as the only site to be characterized for a geologic repository. *The Energy Policy Act of 1992*, Public Law 102-486, directed the Environmental Protection Agency (EPA) to promulgate new health and safety standards for the Yucca Mountain site, based on the findings and recommendations of the National Academy of Sciences. Within one year of their promulgation, the Nuclear Regulatory Commission (NRC) is to revise its technical requirements and criteria for licensing the repository, based on those standards.

As directed by Congress in 1997, the Program has completed a viability assessment of the Yucca Mountain site in 1998. The viability assessment describes the preliminary design concepts for the repository and waste packages; a quantitative assessment of the probable long-term behavior of the repository in its geologic setting; a plan and cost estimate for the remaining work required to complete a license application; and an estimate of the costs to construct and operate the repository in accordance with its design concept. The current Program focus is on performing additional activities necessary to support a recommendation to the President in 2001 on the suitability of the site for construction of a repository. If the site is approved, a license application will be submitted to the Nuclear Regulatory Commission in 2002 for repository construction authorization. The current Program schedule projects the start of repository emplacement operations in 2010.

## 1.3 SYSTEM FUNCTION

The primary function of the CRWMS is to dispose of waste, which includes directing or controlling any physical activity, operation, or process to accept title to and physical possession of spent fuel and high-level waste, and transporting these wastes to the repository for permanent disposal.

## 1.4 PROGRAMMATIC ASSUMPTIONS

To provide for consistency in program planning, system studies, and total system life cycle cost analyses, the following assumptions are made:

A. Waste Acceptance and Transportation

(1) To the extent practicable, waste acceptance and transportation services for spent fuel and high-level waste will provided by the private sector. The Navy will provide transportation of their spent fuel.

(2) Spent fuel and high-level waste will be delivered in several sizes of truck and rail casks.

B. Monitored Geologic Repository

(1) The repository is presumed to be located at the Yucca Mountain site in Nevada.

(2) The repository will be capable of receiving several sizes of truck and rail casks.

(3) Commercial spent fuel (including mixed oxide spent fuel), DOE spent fuel (including Naval spent fuel), and high-level waste (including immobilized plutonium) will be accommodated in the repository.

(4) Waste emplacement in the first repository is limited by current law to 70,000 Metric Tons of Heavy Metal (MTHM) or equivalent of spent fuel and high-level waste, until a second repository is operational.

(5) The repository will be designed to remain open for a period of 100 years from the start of initial waste emplacement. The design will not preclude the capability for the repository to remain open for up to 300 years, with appropriate maintenance and monitoring, if required.

(6) To the extent practicable, the repository will have the capability to accommodate certain types of DOE spent fuel starting from its first year of operation.